

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Civil Action No. 04-11807 MLW

AT&T WIRELESS SERVICES OF MASSACHUSETTS,  
INC., d/b/a AT&T WIRELESS,  
and EASTERN TOWERS, LLC,

Plaintiffs,

v.

TOWN OF WAYLAND, MASSACHUSETTS,  
BOARD OF APPEALS of the TOWN OF  
WAYLAND and JAMES E. GRUMBACH, ERIC B.  
GOLDBERG, STEVEN FUGARAZZO, LAWRENCE K.  
GLICK, SUSAN KOFFMAN, SHAUNT SORIAN,  
ADIA GENNIS, LINDA SEGAL, as they are members  
and alternate members of the Board,

Defendants.

**AFFIDAVIT OF TIMOTHY WYSOCKI**  
**IN SUPPORT OF PLAINTIFFS' MOTION FOR PRELIMINARY INJUNCTION**

1. I am presently Radio Frequency ("RF") Performance Manager for New Cingular Wireless PCS LLC ("New Cingular"), which is the new name for the plaintiff, AT&T Wireless PCS, LLC ("AT&T Wireless"), as a result of a recent merger and acquisition. For sake of continuity and clarity, I will continue to refer to this entity as "AT&T Wireless" in this affidavit.

2. I was employed as RF Performance Manager prior to the merger, having been promoted earlier this year. Before that, I was employed as a Senior RF Engineer for AT&T Wireless and served AT&T Wireless as an RF Engineer since 1996. A summary of my qualifications, and duties and responsibilities, including my experience prior to my employment by AT&T Wireless, is included in the attached copy of my résumé. (Attached as Exhibit A).

3. I have extensive experience in the design and testing of AT&T Wireless' wireless communication facilities as part of its federally licensed network in Massachusetts. For example, I had overall responsibility for the RF design of AT&T Wireless' Liberty Project in New England, which involves a network of hundreds of wireless communication facilities in Massachusetts, including Wayland and the surrounding communities.

4. I have participated in the design of AT&T Wireless' network in Massachusetts from its inception to the present, and I have participated in various engineering efforts to provide a quality system build-out including: (a) evaluating zoning provisions applicable to wireless communication facilities in various communities, (b) testifying before local zoning boards in zoning hearings, (c) preparing search areas for new installations, (d) participating in drive tests and reviewing drive test results, (e) participating in site visits, (f) preparing RF designs for proposed installations, (g) reviewing plans and preparing RF packages for zoning hearings, (h) testing and evaluating new sites, and (i) locating and correcting system performance problem areas. I have signed numerous reports in the course of my duties, including AT&T Wireless' Coverage Report provided to the Wayland Zoning Board of Appeals ("Board") during the local administrative hearings in this case. A copy of that report is attached as Exhibit B. Among other things, this affidavit amends and supplements that report.

5. I am acutely aware of AT&T Wireless' efforts to site a suitable wireless communication facility or facilities in Wayland, having been personally involved in those efforts since approximately 1998. I have personally reviewed RF coverage information for AT&T Wireless' existing and proposed sites and potential alternative locations to the proposed site.

### **THE WIRELESS NETWORK**

6. AT&T Wireless is licensed by the Federal Communications Commission to provide wireless phone service in areas across the country, including the Boston Metropolitan Trading Area ("MTA"). The Town of Wayland is located within the Boston MTA and therefore AT&T Wireless is licensed to provide personal wireless communication services within the Town of Wayland and surrounding communities.
7. Wireless phone coverage is provided by placing a number of low-power antenna sites within a given area. The sites are spaced so that the coverage from each location overlaps with its neighboring sites. At the power levels used by this technology, and with the need to fit each site into a network, the usable signal from a given site is generally limited to about a 2 or 2.5 mile radius (give or take a half a mile), which may be further limited by topography.
8. When a call is placed, the wireless phone's signal is received by the nearby site sending the strongest signal to that phone. During the call, the phone monitors the signal from the serving site, as well as the signal of all of the adjacent sites. When the phone receives a stronger signal from an adjacent site (for instance, if the user is traveling away from the serving site), it requests a transfer from the site it is currently using to the stronger site. If the carrier's network is providing seamless coverage in the area, the call will transfer without interruption. This is called a "handover". If the appropriate signal strength is absent at the transfer point, the call will degrade and possibly drop. In an area where AT&T Wireless lacks sufficient coverage ("Coverage Gap"), an AT&T Wireless customer likely will not be able to initiate a call on AT&T Wireless' network, continue a call on AT&T Wireless' network, and/or take advantage of

any other advanced features of AT&T Wireless' network for data services, short text messaging, or the like.

9. AT&T Wireless currently has no facilities whatsoever in Wayland. Any AT&T Wireless coverage provided in Wayland derives from its existing facilities in abutting towns.<sup>1</sup> I have attached to this affidavit, as Exhibit C, a list of the facilities currently operated or proposed by AT&T Wireless in Concord, Framingham, Lexington, Lincoln, Maynard, Natick, Newton, Sherborn, Sudbury, Waltham, Wellesley and Weston. I have also attached a coverage map (Exhibit D, discussed below) showing AT&T Wireless' actual and anticipated coverage from the actual or proposed facilities at these locations.

10. Pursuant to §§ 198-1504.2.4.1 and 198-1504.2.4.2 of the Wayland Zoning Bylaw ("Bylaw"), I provided the Board a coverage map (including either proposed facility) to demonstrate AT&T Wireless' other existing and proposed facilities within five (5) miles of the Wayland border. A copy of that map is attached as Exhibit D. A key to that map, listing information for each facility is attached as Exhibit C.

11. As can be seen from the list of facilities and the coverage map, AT&T Wireless has no sites operating in Wayland, and AT&T Wireless has a significant gap in coverage in Wayland. Also as can be seen, as more and more facilities in abutting towns are fixed as to location and height, the opportunity to fill any remaining substantial coverage gaps narrows down to specific geographic areas and heights. Such is the case in Wayland.

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<sup>1</sup> AT&T Wireless does have a roaming agreement with another FCC-licensed wireless carrier in this area; however, that carrier too lacks adequate coverage in Wayland so even roaming service is unavailable. Indeed, to the best of AT&T Wireless' knowledge, none of the six major FCC-licensed carriers doing business in this area has any facilities in Wayland.

12. Thus, AT&T Wireless has aggressively pursued the build-out of its network in Wayland (although thus far unsuccessfully) and the communities surrounding Wayland, among other places, because they represent major population centers with a high volume of actual and potential customers of AT&T Wireless' services, and they are traversed by a number of federal and state highways along which there is a pressing demand for wireless communication services. Without limitation, AT&T Wireless has aggressively pursued the build-out of its network along Route 20 because it is a major state-numbered road carrying a significant volume of traffic to and from Interstate 95/Route 128 and the Massachusetts Turnpike and has substantial population living and driving along its side roads.

13. To address this pressing need for wireless communications facilities along Boston Post Road (Route 20), AT&T Wireless has constructed a 150' multi-carrier facility on property of the Town of Sudbury on Boston Post Road in Sudbury (which it was awarded pursuant to a Request for Proposals issued by the Town of Sudbury)("Sudbury Landfill Site"). Pursuant to the Town of Weston's Request for Proposals, AT&T Wireless was awarded a contract to install, and ultimately received approval for, a proposed 90<sup>2</sup> flagpole-style facility on property of the Town of Weston at the Police Station off Boston Post Road in Weston ("Weston Police Site"). However, due to the recent merger of Cingular and AT&T Wireless, the proposed AT&T Wireless facility at the Weston Police Site may no longer be necessary because the existing Cingular facility at the same location.<sup>3</sup> Even so, both the Town of Sudbury and the Town of Weston have very restrictive Wireless Bylaws, and the choice of locations in these towns is

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<sup>2</sup> I understand that the Weston Police tower was eventually approved at 100', to permit location by Sprint at the 100' height, but AT&T Wireless' installation would have been at 90'.

<sup>3</sup> This statement only applies to the need for an AT&T Wireless facility at the Weston Police Site, and is not an

fixed. The Sudbury Landfill facility is on property, that essentially abuts the Town of Wayland. Therefore, there is no reasonable way to install another wireless communication facility in either Sudbury or in Weston to address AT&T Wireless' substantial coverage gap in Wayland along Route 20 between these two sites. Only a site in Wayland can accomplish this.

### **PROPOSED FACILITY**

14. AT&T Wireless proposes to collocate its wireless communications facility with Sprint within and next to a stealth flagpole-style monopole to be built and owned by Eastern Towers, LLC (now known as "Horizon Towers"), at 137 Boston Post Road, Wayland, shown on Assessor's Map 29, Lot 041 ("the Site"). Alternatively, it would locate at an adjoining site proposed by Sprint at 135 Boston Post Road, Wayland ("the Classic Clocks Site"), if the Board approved that site. During the hearings before the Board, I learned of the desire of other carriers, including Cingular to locate at the Site.

15. The Site and the Classic Clocks Site were not chosen lightly. They reflect an attempt to deal with prior objections to other sites, and the Town's changes in its Bylaw and other actions regarding wireless facilities in Wayland. Indeed, the long history of AT&T Wireless' attempts to cover this portion of Wayland is chronicled below under the heading "Prior Efforts to Locate in Wayland".

16. As shown on the plans submitted with AT&T Wireless' zoning applications, AT&T Wireless' proposed facility consists of the following:

- AT&T Wireless will install three (3) wireless communication antenna sectors within a proposed 120' self-supported stealth flagpole-style monopole. (AT&T Wireless would have the top spot (at 117' antenna centerline) on the Eastern

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opinion regarding whether the approved flagpole-style monopole will be needed by Sprint or another entity.

Towers monopole and the second spot (105' antenna centerline) on the proposed Sprint monopole at the Classic Clocks site.)

- The antennas will be connected to telecommunications equipment in a Nokia<sup>4</sup> equipment cabinet(s) located within the proposed compound at the base of the tower by means of coaxial cables. The coaxial cables will run from the antenna down the inside of the monopole, exit out a port at the base of the monopole and run covered within a cable tray to the Nokia equipment cabinet(s).
- The facility will be connected to standard electric and telephone utilities to be installed within the proposed equipment compound.

17. The proposed PCS wireless facility will enhance wireless telephone service to the residents and businesses of Wayland. Through a fully digital system, this technology affords improved reception, more private communication, increased ability to handle data, short messaging, enhanced cellular battery life, and other technological advances.

18. The characteristics of the installation, as originally proposed,<sup>5</sup> are as follows:

- Number of AT&T Wireless' antennas to be located on the tower: Three
- Antenna type, manufacturer and model number: Allgon 7262.02 (but see FN 4)
- For each antenna, the antenna gain and antenna radiation pattern: 16dBi and 90 degree beamwidth
- Number of channels per antenna projected: two, and can go to the maximum of four.
- Maximum power input to the antennas is 28 watts.
- Output frequency of the transmitter is in the A-Band 1900 MHz (but see FN 4).

19. AT&T Wireless' proposed use is passive, requires no employees on the premises, and will generate only about one vehicle trip per month, will be served by standard electrical service, and requires no water, sewer or other town services. AT&T Wireless' facility will comply in all

<sup>4</sup> At the time of the application, we anticipated using an Ericsson RBS 2106 equipment cabinet. The change in designation of equipment cabinet does not affect my analysis.

<sup>5</sup> Due to the merger of AT&T Wireless and Cingular, the current preference would be for dual band antennas – i.e. antennas that would serve both the 1900 MHz and 850 MHz frequency bands, if the pole can physically accommodate them. The antennas are somewhat wider and larger than the antennas originally proposed. If the dual band antennas cannot be accommodated, then the original proposal would stand, and the Cingular antennas would be installed separately to cover the 850 MHz band. This is a detail to be worked out and does not affect the analysis

respects with RF emission standards established by the Federal Communication Commission and any lawful and applicable regulations administered by the Massachusetts Department of Public Health. AT&T Wireless' facility will generate no objectionable noise, vibration, smoke, dust, odors, heat, glare or other effects.

20. AT&T Wireless' proposed facility will promote the interests of collocation. AT&T Wireless has no objection to such additional use, not inconsistent with AT&T Wireless' use.

21. The facility will not trigger any lighting or marking requirements of the FAA or the Massachusetts Aeronautical Commission. The facility generates no objectionable noise, vibration, smoke, dust, odors, heat, glare or other effects.

#### **COVERAGE GAP**

22. On behalf of AT&T Wireless, and as more fully shown below and on the attached exhibits, I have confirmed that a Coverage Gap exists in the area of the proposed Wireless Communications Facility. The purpose of installation of the proposed facility is to address this Coverage Gap.

23. In this case, I have evaluated the coverage gap using two primary sources of information, as well as my general knowledge of the AT&T Wireless network, the relevant geographic area and the signal characteristics of that network. The two sources of information are: (1) standard computer-generated propagation maps and (2) drive tests of actual signal strengths in the area. I have also reviewed statistics regarding the actual performance of the network, as measured by the number and proportion of dropped calls, and the data on the causes of dropped calls.



*Computer-Generated Maps*

24. To demonstrate why the proposed use is necessary, I have attached two coverage maps of the Town of Wayland and the nearby vicinity (one map without the proposed facility (Exhibit E to this Affidavit) and the other map with the proposed facility (Exhibit F to this Affidavit)).

25. These maps show the locations of AT&T Wireless existing and approved wireless communications facilities in and near Wayland, as well as the proposed facility at this Site. Site No. 912002014A01 represents the proposed facility. While these maps suffice to show the Coverage Gap, I have also considered additional computer-generated coverage maps as follows:

26. Exhibit G is a map with the proposed facility at the Classic Clocks site and without the proposed facility at the Eastern Towers site.

27. Exhibit H is a map with a proposed facility at the Eastern Towers site at 55' and without the proposed facility at the Classic Clocks site.

28. Exhibit I is a map with the proposed facility at the Classic Clocks site at 45' and without the proposed facility at the Eastern Towers site.

29. The coverage maps were prepared by Sandeep Goyal, then a senior RF engineer with Bechtel Telecommunications, which provided consultant services to AT&T Wireless at the time the maps were created and at the time of my testimony before the Board. In performing my professional duties in the RF field for AT&T Wireless, I customarily have relied upon RF plots and analysis prepared by RF specialists, including Mr. Goyal and others at Bechtel Telecommunications. The computer program that he used to generate coverage plots is generally accepted by experts in the RF field. In my experience over the years, I have observed a good

correlation between the projected coverage shown on such coverage plots and the actual, measured coverage provided by AT&T Wireless' sites, once built.

30. Mr. Goyal has prepared the attached coverage maps using a -95 dBm coverage threshold for the proposed site and for neighboring existing and proposed sites which are located outside the Town of Wayland. In my opinion, that coverage threshold is appropriate for present purposes, to a reasonable degree of certainty in the RF field. That coverage threshold certainly does not overstate the Coverage Gap and, indeed, represents weaker coverage than AT&T Wireless has used to design coverage for in-vehicle purposes, in-building purposes, wireless data applications, and other purposes at various sites and in various locations. Over time, a stronger signal may be appropriate, as customer demand increases and technology enables the network to provide more features and services.

31. These coverage maps were generated using an RF Propagation computer-modeling program. The software takes into account the geographical features of an area; antenna models, antenna heights, and RF transmit power. The maps represent existing and proposed antenna locations, and the areas that currently have quality wireless phone service based on these locations. Any phone that travels outside of the effective coverage area will have a high likelihood of a degraded and possibly dropped call.

32. These maps show that, without the facility at the Site, there would be a substantial Coverage Gap along Route 20 and adjacent roads and throughout surrounding areas in Wayland including, without limitation, from the vicinity of Wayland Center (where the coverage from the Sudbury facility drops off), easterly along Route 20 (to where the proposed coverage from proposed Weston Police facility would pick up), along side roads and in the areas adjacent to these roads. This is an important area in which AT&T Wireless would lack adequate communications

network service without the facility at the site. The installation at the proposed elevation on the Site is necessary in light of this substantial coverage gap in the Town of Wayland.

#### *Drive Tests*

33. During proceedings before the Board, questions arose about conducting a drive test. A drive test involves driving a car along the roads within a few miles of the proposed site and using radio frequency equipment to measure the signal strength received by antennas outside the car. The drive test measures existing signal strength without the proposed facility. By placing a temporary transmitter at the location of the proposed site, the drive test can also measure signal strength from the proposed facility.

34. Because a drive test only gives information about the conditions at one particular time, it is important to consider those conditions in coming to any conclusions. One important factor is the presence or absence of foliage, because foliage tends to absorb radio frequency signals at the frequencies involved here. A drive test conducted in winter (or late fall or early spring), when leaves are off the deciduous trees, will tend to show a stronger signal than a drive test conducted from about May 15 to September 30 in a wooded suburb like Wayland. Because the wireless network must operate throughout the year, the results of a summer drive test reveal coverage gaps more accurately than a test conducted in the winter.

35. Other variables include whether the test is conducted during periods when the network is being used heavily or weather conditions (both of which can cause interference) and natural fluctuations in interference due to ambient radio frequency phenomena at any given time.

36. It is also important to consider the obvious limitation of a drive test, which can only record signal strength levels on the roads actually driven. In this case, for instance, a drive test taken on

Route 20 may not reflect signal strength levels on adjoining roads or at nearby residences. In addition to terrain and foliage influences, the signal strength on a major through road like Route 20 can reflect the tendency of radio frequency signal to run more easily within the channel created by cleared area of the road itself.

37. Interpreting drive test results also requires recognition of the fact that the units (decibels with respect to a milliwatt, known as "dBm") are expressed as a negative number (technically, a negative exponent, i.e. a fraction<sup>6</sup>). Accordingly, the stronger the signal strength, the lower the numerical value. For instance, -95 dBm reflects a stronger signal than -100 dBm.

38. There have been several drive tests conducted of this site by AT&T Wireless and its consultants, and I understand that the Town's consultant conducted a form of drive test as well. I will address the most informative and reliable drive test in detail first, followed by a brief discussion of the other tests and their significance, if any.

39. On September 27, 2004, at my direction, and based upon his report to me, AT&T Wireless RF department employee Joe Anderson drove the Wayland area in question collecting data with a suite of professional wireless optimization and network analysis tools widely used in the wireless telephone industry, trademarked by Ericsson and known as TEMS<sup>TM</sup>. This process employs two Sony Ericsson T616 units, mounted side by side on the dashboard. These units measure the received signal strength (known as "RSSI"), i.e. the level of signal received by the monitoring equipment at AT&T Wireless' licensed broadcast frequency. Unit 1 collected "Follow Call" data (RSSI measurements while on a call), while Unit 2 collected "Scan data"

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<sup>6</sup> Should the Court wish to pursue the mathematics further, it is probably enough to note that, because the values are fractions, an increasing dBm numerical value corresponds to a larger denominator; hence it corresponds to a smaller

(scan of all ATTWS Broadcast Control channels ("BCCH")). Using these data, two other AT&T Wireless RF Department employees, Andrew Williamson and Jose Hernandez processed and formatted the data into readable and usable form. Joe, Andrew and Jose all were working for me at the time the data were collected, processed and formatted. They have been trained in these tasks to provide accurate and reliable data collection, processing and formatting services. At the time, Andrew was employed at RF Engineer IV, Jose was an RF Engineer II, and Joe was an RF Engineer III. I have relied regularly upon their work in the ordinary course of my radio frequency duties with AT&T Wireless.

40. Attached as Exhibit J are two charts showing the results of the September 27, 2004 drive tests. Each data point is shown by a colored circle. The color green indicates a measured signal (RSSI) between -30 dBm and -75 dBm, which is the strongest signal range shown on the chart and represents excellent coverage outside, inside a car, and even inside a standard, non-wooden building. Yellow represents a measured signal between -76 dBm and -95 dBm, which is within the range AT&T Wireless sought from this site (even though, at the higher end of that range, users may experience some loss of quality, particularly for calls made inside cars or buildings). Red represents a signal strength from -96 dBm to -99 dBm, which falls below the design standard for this site and is likely to result in problems associated with inadequate signal strength, as discussed above. Black represents a signal strength of -100 dBm or below, which is very likely to cause such problems, if the user can establish and maintain any connection with the AT&T Wireless network at all.

41. The Charts also depict the adjoining sites, which currently provide most of the signal, to the extent measured in the area. The site listed as MA0345B is the AT&T Wireless facility at

Sudbury Landfill; it is the dominant server for most of the area at present, which means that, where signal exists, this site tends to provide the strongest signal and would therefore communicate with the user's mobile phone, given sufficient signal strength. The site listed as MA0051C is the AT&T Wireless facility on Bear Hill in Waltham. It is miles from the affected area, but is at a high elevation and provides some weak coverage on Rt-20 through Weston up to the Wayland line.

42. Based upon the data, as reflected on the charts, there are many locations (shown in red and black) where the signal strength falls below -95 dBm. Indeed, most of the signal recorded below -95 is also below -100 dBm. These readings evidence areas that do not come close to providing the necessary signal strength to serve the coverage area.

43. Based upon the computer-generated coverage charts and the drive test data, I have also evaluated whether the gap can be filled from the previously discussed Weston Police Site located off Boston Post Road approximately 1.25 miles from the Weston-Wayland town. While the drive test data do not reflect that site, the coverage chart demonstrates that coverage from the Weston Police Site would only carry a short distance into Wayland, and would fail to solve the inadequate signal strength in the Coverage Gap. That conclusion is confirmed by my knowledge of the topography of the area, including the fluctuations in terrain and relatively lower elevation in the vicinity of the Site. It is also consistent with the distance of about 4 miles between the Weston Police Site and the Sudbury Landfill, which exceeds the distance that I would expect for a network to provide -95dBm coverage to an area with the topography, foliage and other characteristics of this particular site, particularly where demand for that coverage extends along a state numbered route, adjacent roads, and surrounding suburban residential areas. I conclude that

the construction of the Weston Police site does not provide the means to eliminate the significant coverage gap in the area of the Site.

*Network Performance Data*

44. Attached as Exhibit K are two charts showing statistics on the number and causes of dropped calls, which are calls that terminate without instructions from consumer to do so (i.e. without "hanging up" in colloquial terms). These statistics reflect the current two sites (Sudbury Landfill and Bear Hill) that now serve the area. Each chart shows the daily dropped calls over a two-week period for one of the sites on the antenna(s) covering the sector that points toward the Site. The Chart labeled MA0051C shows data for sector C of the facility on Bear Hill in Waltham. The Chart labeled 345B shows data for sector B of the Sudbury Landfill facility.

45. The data reflect all calls on the sector in question and, therefore, include many calls on mobile phones that never enter the Coverage Gap. As a result, the data are useful to show the absolute numbers of calls on the sector that are dropped because of low signal strength, but cannot be used to derive the proportion of dropped calls occurring within the Coverage Gap. Such a proportion could be misleading, in any event, as consumers tend to refrain from making calls in an area that they learn has poor coverage. By contrast, where the data show that low signal strength was the reason for dropping a call, it is reasonable to infer that the phone was in an area of low signal strength, which in this case is most likely the Coverage Gap.

46. As shown by the dropped call statistics, the predominant reason for dropped calls on both sectors is low signal strength. The chart lists such calls under the heading "TDISS-BL", which includes disconnections due to low signal strength (RSSI) on both the signal sent to the base station facility (known as the uplink, designated as "UL") and on the signal sent to the

consumer's mobile phone (known as the downlink, designated as "DL"). The following abbreviations are used on the Dropped Call chart:

-Total Seizures is the sum of all calls initiated by a consumer on mobile phones within the area served by the base station plus the calls initiated in other areas on phones that later move into the base station's area and therefore are transferred to that base station ("hand ins")

-TNDROP Total number of dropped calls recorded (inclusive of all sub categories below)

-TDISS Total dropped calls recorded due to insufficient signal strength

-TDISSDL Dropped calls recorded due to insufficient signal strength in the DownLink (site to mobile)

-TDISSUL Dropped calls recorded due to insufficient signal strength in the UpLink (mobile to site)

-TDISSBL Dropped calls recorded due to insufficient signal strength in Both UL and DL (shows proper path balance, this is where drops should appear if a coverage limited situation)

-TDISQA Total drops due to bad quality

-TDISQAUL Drops recorded due to bad quality on the Uplink -TDISQADL Drops recorded due to bad quality on the DownLink -TDISQABL Drops recorded due to bad quality on BOTH UL and DL.

-TSUDLOSS Drops due to sudden event (often hardware or site T-1 failures)

-Drops Other Almost always Drops due to land line (T1 line) problems

47. Adding the data from the two charts together, total dropped calls due to inadequate signal strength from the two sites ranged from 82 to 141 during the weekdays and 45 to 93 on weekends over the 16 day period shown on the chart. These callers experienced the full impact of the Coverage Gap; others undoubtedly experienced significantly reduced signal quality. These impacts are not compatible with a fully functioning PCS network, with adequate coverage from a site serving the Coverage Gap.

48. I have also considered other drive tests. To the extent that they provide useful information, they are consistent with the above analysis. For instance, AT&T Wireless



conducted a drive test in August, 2004, which showed numerous values below -95 dBm, but failed to record much of the area to the west of the Site on Route 20, due to equipment problems, which is why we redid the drive test in September. In addition, AT&T Wireless asked a consultant to do a drive test in January 2004 as part of an overall evaluation of the network. I would expect higher signal strength in January, due to the absence of foliage, and the test indeed did show higher values. As with the September 27 drive test, the January results showed the weakest signal to the west of the Site, and on Old Connecticut Path to the southeast of the Site, but the results in those areas ranged from -85 dBm to -95 dBm. This is consistent with values below -95 dBm when the leaves are on the trees, as measured on September 27, 2004.

Likewise, it is consistent with the oral testimony of the town's consultant, David Maxson (reported on pages 25-26 of the transcript of the Board's hearing on June 22, 2004) regarding an impromptu partial "drive test" that he conducted with equipment that happened to be in his car while he was driving with his daughter. Mr. Maxson acknowledged that "it was not a full drive test, but . . . a series of measurements along Route 20" and that "there are locations where it does appear the signal strength falls to the minus 95 dBm level, perhaps a little below it."

49. I attached as Exhibit L the initial report of Mr. Maxson. His conclusions that a coverage gap exists (existing signal strengths are "below the level of practical use, by any reasonable standard") confirm my own conclusions and that of Bechtel. While Mr. Maxson later qualified his opinion, his analysis does not contain any scientifically reliable information to contradict the existence of a coverage gap. In any event, his initial analysis was correct.

50. Project opponents presented to the Board some material compiled by persons not expert in radio frequency engineering, including subjective evaluations of call quality, a tape recording

and the like. These materials are not appropriately considered by experts in the RF field. In the course of making decisions where to invest AT&T Wireless' capital for building new sites, I rely upon objective data and calibrated computer modeling, rather than subjective observations of lay people. In particular, I rely upon computer mapping, drive tests and other technical information gathered on behalf of AT&T Wireless demonstrating the existence and extent of the Coverage Gap. In addition, the lay materials are misleading in that many of the locations from which so-called "testing" occurred are areas outside the coverage gap at issue. See Transcript of the Board's June 22, 2004 hearing, pp. 19, 66-67. For instance, the averaging of call quality perceived by project opponents includes some areas where AT&T Wireless already shows coverage from existing and proposed. Id. There are also some instances where the project opponents indicate "good" coverage, and AT&T Wireless' data shows lack of adequate coverage. An important consideration is that AT&T Wireless and other wireless providers design their networks for everyday use. This includes normal use, such as on the street, in a car and in a home or business. Radio signals at the frequency used by AT&T Wireless and other PCS carriers lose strength as they pass through objects, including the outside of an automobile or a building. It appears from the opponents' presentation that the "testing" by the group was almost exclusively, if not exclusively, performed outdoors on Route 20 in December, 2003 – i.e. during a low foliage period. See Board's June 22, 2004 transcript, pp. 36- 42. Another so-called lay "test", presented by project opponent Margaret Patton, allegedly consisted of driving once on Route 20 at a low-volume time of day in the fall (2PM to 2:30 PM on October 15), included some areas outside the Coverage Gap and showed evidence of a loss of signal strength near Shir Tikva Temple. Id. pp. 11-24. Finally, one Board member reported inability to connect to the network on Lee Road, 1 ½ blocks from Route 20. Id., p. 43. While that report and the low

signal strength at Temple Shir Tikva might be viewed as supporting my analysis, I would not rely on that or any other of the lay materials to form a conclusion. To design a system, one must consider other scenarios, including coverage on adjoining roads and at residences, high volume periods, ambient interference, and the fact that trees have more leaves after mid-spring. My modeling does so; the opponents' so-called "testing" does not and has no scientific value for purposes of determining a coverage gap.

51. In short, the comprehensive drive test taken systematically in September 27, 2004 not only on Route 20, but on adjoining roads therefore confirms AT&T Wireless' RF presentation before the Board, and there is no reliable evidence of which I am aware that contradicts that conclusion.

#### **SIGNIFICANCE OF THE GAP**

52. As one measure of the significance of a coverage gap, AT&T Wireless considers traffic count data published by the Massachusetts Highway Department. It is customary in the field of Radio Frequency design of wireless communication networks for experts such as myself to review and rely upon published traffic volume data from the Massachusetts Highway Department ("MHD").

53. MHD has published the following Average Daily Traffic Counts for state-numbered roads in Wayland in 1999 (excerpted pages documenting these figures are attached as Exhibit M):

| LOCATION                   | AVERAGE DAILY TRAFFIC |
|----------------------------|-----------------------|
| Route 20 East of Route 27  | 23,100                |
| Route 20 West of Route 27  | 18,600                |
| Route 27 North of Route 20 | 25,000                |
| Route 27 South of Route 20 | 16,400                |

This is a significant volume of traffic and reflects the actual pressing need for high quality wireless communication services along Route 20 and in surrounding areas.

54. As another measure of the significance of a coverage gap, AT&T Wireless also considers population data. The Town of Wayland website lists the population of the Town, as of the 2000 Census, at 13,949, with an area of 15.28 square miles (which I calculate to be a population density of about 912.9 people per square mile). See Exhibit N, attached.

55. AT&T Wireless is required by the terms of its federal license to provide adequate service to the population within its service territory within specific deadlines. Attached as Exhibit O is an excerpt from the FCC regulations, 47 CFR Part 24, regarding Personal Communications Services ("PCS"). Pursuant to 47 CFR 24.203(a):

Licenses of 30 MHz blocks must serve with a signal level sufficient to provide adequate service to at least one-third of the population in their licensed area within five years of being licensed and two-thirds of the population in their licensed area within 10 years of being licensed. Licensees may choose to define population using the 1990 census or the 2000 census. Failure by any licensee to meet these requirements will result in forfeiture or non-renewal of the license and the licensee will be ineligible to regain it.

56. AT&T Wireless has examined the area for the most appropriate means of providing the required coverage. I have determined that construction of the proposed facility at the Site or the Classic Clocks Site is the most appropriate means of addressing the significant gap in AT&T Wireless' coverage within this area of the Town of Wayland. The proposed facility must be located outside the Bylaw's Wireless Overlay District at a site such as the Site or the Classic Clocks Site<sup>7</sup> due to technical, topographical and other unique circumstances relating to the Coverage Gap, including the ground elevation of the Site.

### ALTERNATIVES

57. In my professional opinion, it is not possible to address AT&T Wireless' substantial Coverage Gap by using any of the sites in the Wireless Overlay District. Nor is it possible to address the Coverage Gap with existing sites. The potential alternatives that I have examined and that might work from an RF point of view (Classic Clocks site, Boston Edison Towers Nos. 112, 120-132) are addressed and rejected as unavailable for reasons stated by others.

58. In the first place, I considered the sites listed the attached chart (Exhibit C), discussed above, which contains certain site information for each of AT&T Wireless' other existing and proposed facilities within five (5) miles of the Wayland border. As demonstrated by the attached coverage maps (Exhibit D), these other existing or proposed sites do not already provide adequate coverage. Based upon my knowledge of the technology and terrain, they do not have the potential, by alteration or site adjustment, to provide adequate coverage, to the area of Wayland that would be addressed by the proposed facility because of factors such as the location of these sites with respect to the Wayland coverage gap in question, the available height at these

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<sup>7</sup> Alternatives are discussed below.

sites, the intervening topography, and the limitations of PCS wireless technology. The drive tests (Exhibit D) confirm this conclusion as to existing sites.

59. Second, I have been involved for many years in the attempts to locate a proposed facility on Boston Edison Company ("BECO") electric transmission tower number 112. The futility of those efforts is detailed extensively below in the section of this affidavit entitled "Prior Efforts in Wayland."

60. Third, I have evaluated whether AT&T Wireless can cover the Coverage Gap from a location within the Town of Wayland's Wireless Communications Services District. Indeed, after AT&T Wireless and Sprint approached the Town of Wayland to initiate a building permit application for the proposed facilities, the Town's Executive Secretary Jeff Ritter sent a certified letter stressing the Town's desire to have the carriers locate a facility within the Town's existing Wireless Overlay District, and in particular BECO stanchions 101 and 102 and the Old Landfill. The letter indicated the Town's belief that those locations would be able to connect to the Weston Police station site.

61. In evaluating possible coverage from the Wireless Communications Services District, I reviewed the Bylaw and observed that Wayland's current wireless communications facilities zoning bylaw establishes the following Wireless Communications Services District where such facilities are permitted by special permit with site plan review:

§198-302.1.8 A Wireless Communications Services District that includes the land owned by the Town of Wayland known as the "old landfill site" as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22 and 23, Parcels 22-001 and 22-002, and known as the "new landfill site" as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 17, 21, and 22 inclusive, Parcels 17-018, 21-010A, 21-012A, 21-012B, 21-012C, 21-012D, 21-012E, 21-012F, 21-012G, 22-003, 22-004, 22-006, 22-007; and the land comprising the portion of the so-called Massachusetts Bay Transit Authority, currently known as

Massachusetts Bay Transportation Authority (MBTA), "right-of-way from its boundary with the southerly sideline of Boston Post Road (Route 20) westerly to its westernmost boundary with the Town of Sudbury as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22, 26 and 27, inclusive, and as shown on the plan entitled "Town of Wayland Wireless Communications Services District Special Town Meeting - November 17, 1999," dated September 16, 1999, prepared by the Town of Wayland Survey Department, a copy of which plan is on file in the Office of the Town Clerk (Added STM 11/17/99 by Art. 3); and

§198-1502.1. The Wireless Communications Services District shall be located on land owned by the Town of Wayland known as the "old landfill site" (as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22 and 23, Parcels 22-001 and 22-002), and part of the land known as the "new landfill site" (as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 17, 21 and 22, inclusive, that part of Parcel 17-018 that is south of a continuation of the parcel line that extends northeasterly from the point of the intersection of parcel lines for Parcels 21-010A, 21-012F, 22-004 and 17-018 to meet the northeast parcel line of Parcel 17-018, Parcels 21-010A, 22-003, 22-004, 22-006 and 22-007) and on the land comprising the portion of the so-called Massachusetts Bay Transit Authority, currently known as "Massachusetts Bay Transportation Authority (MBTA), "right-of-way from its boundary with the southerly sideline of Boston Post Road (Route 20), westerly to its westernmost boundary with the Town of Sudbury as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22, 26 and inclusive, and as shown on the plan entitled "Town of Wayland Wireless Communications Services District Special Town Meeting - November 17, 1999," dated September 16, 1999, prepared by the Town of Wayland Survey Department, a copy of which plan is on file in the Office of the Town Clerk. (Amended 11-17-1999 STM by Art. 3; 5-4-2000 ATM by Art. 33).

62. The Bylaw provides that a wireless communication facility "may be erected in the Wireless Communications Services District upon the issuance of a special permit ... and subject to site plan approval...." and subject to the various requirements of the Bylaw. See § 198-

1503.1. The Bylaw establishes the following height limit for new towers:

1503.2.4.1. Except for the BECO towers [in the District], if there is no significant tree canopy elevation, as defined in § 198-1503.2.4.2 below, the maximum height of any antenna support structure or any antenna or any component thereof or attachment thereto **shall not exceed 55 feet above finished grade** of ground elevation. (emphasis added).

1503.2.4.2. For the purpose of this Article 15, "significant tree canopy elevation" shall be defined as the arithmetic average of the elevations of the tops of all trees at least 6 inches in diameter at four feet and over 20 feet tall in a stand of trees, all of which are located within a 150-foot radius of the base of the proposed antenna support structure, provided that at least 10 such trees are in said stand. Elevations shall be measured with respect to mean sea level datum.

1503.2.5. Except for the BECO towers, **no antenna**, nor any support structure, nor any antenna or any component thereof or attachment thereto **shall be located at a height in excess of 55 feet**, unless there is such a significant tree canopy elevation, as defined in Section 198-1503.2.4.2 above.

63. The Bylaw includes the following additional height limitation with respect to facilities located on BECO towers in the District:

1503.2.14. Any antenna or equipment mounted on or attached to any of the BECO towers **shall not extend more than 25 feet above the highest point of said towers.** (emphasis added)

64. Thus, the District essentially consists of the Wayland Landfill (new and old) and the portion of the MBTA right of way from Route 20 to the Wayland/Sudbury town line. The Wayland Landfill is proximate to the Sudbury Landfill where AT&T Wireless has installed a 150' flagpole style monopole capable of accommodating itself and two other carriers.

65. The attached coverage chart (Exhibit P) shows the coverage footprint from AT&T Wireless' existing facility at the Sudbury Landfill. The drive tests (Exhibit J) show a similar footprint. Coverage from that facility extends for some distance into Wayland.

66. If AT&T Wireless were to construct a new 55' tower at the Wayland Landfill (the maximum height allowed by the Wayland Bylaw in the absence of a significant tree canopy), the coverage from that facility would be inferior to and redundant of AT&T Wireless' installation at the Sudbury Landfill. Even a significantly taller new tower (e.g., 200 feet tall) at the Wayland Landfill would be inferior to and largely redundant of AT&T Wireless' installation at the



Sudbury Landfill. I also reviewed potential tower placement at the location in the Wireless Communications Services District closest to the Coverage Gap, but even a 200 foot tall tower would not address the Coverage Gap. See Exhibit Q, attached (coverage map of 200 foot tower at the closest point of the Wireless Communications Services District, by Sandeep Goyal). Neither option would close the coverage gap to the proposed Weston facility.

67. Part of the reason for this conclusion is topography. Attached as Exhibit R is a color map depicting the topography of the area, with the highest areas shown in red, and the lowest shown in blue, with intermediate elevations shown in yellow and green. The Sudbury Landfill is situated at the top of the hill next to Route 20 at the Sudbury/Wayland town line. The MBTA corridor running from the Wayland/Sudbury town line to the southerly sideline of Route 20 is at a significantly lower elevation than the Sudbury Landfill.

68. In my professional opinion, it is not possible to address AT&T Wireless' substantial coverage gap along Boston Post Road (Route 20) in Wayland between AT&T Wireless' existing 150' facility on property of the Town of Sudbury on Boston Post Road in Sudbury, and its proposed 90' facility on property of the Town of Weston off Boston Post Road in Weston (for which AT&T Wireless has recently been awarded the contract pursuant to the Weston's Request for Proposals), by using a conforming facility in the Town's existing Wireless Communications Services District, and in particular BECO stanchions 101 and 102 (See Coverage Plot by Sandeep Goyal of BECO stanchion at 122 feet, attached hereto as Exhibit S) and/or the Old Landfill. Further, the Town's existing Wireless Overlay District, and BECO stanchions 101 and 102 and the Old Landfill, are in close proximity to AT&T Wireless' Sudbury Facility, raising very real concerns about interference between the sites, overlapping coverage, and inefficient use

of AT&T Wireless' allotted spectrum. These concerns are so serious that AT&T Wireless evaluated but declined to even bid on the Town of Wayland's Request for Proposals, with bids due by 12:00 noon, Friday, September 20, 2002, for a wireless communication facility on Town-owned property in the Wireless Overlay District.<sup>8</sup>

69. In short, AT&T Wireless cannot reasonably address its significant coverage gap for which the current facility is proposed by any conforming site in the Wayland Wireless Communications Services District.

#### **PRIOR EFFORTS IN WAYLAND**

##### *AT&T Wireless' Proposed Facility on BECO Tower 112*

70. Beginning in approximately 1998, AT&T Wireless has worked to site a facility on a power mount pole mounted on an existing Boston Edison electric transmission tower on a discontinued MBTA railroad right-of-way in Wayland center. At the time AT&T Wireless proposed this facility (to be collocated with a proposed facility of Omnipoint Communications, now T-Mobile), AT&T Wireless relied on Section X F 6 of the Wayland Wireless Communications Services District Bylaw which exempted the proposed wireless communication facilities from the Wireless Communications provisions of the Zoning Bylaw because:

- The existing electric power transmission tower number 112 is situated in the MBTA right-of-way described in X F 6 c. of the Bylaw.
- The tower is located within 80 feet of the boundary of a Limited Commercial District or Light Manufacturing District under Section X F 6 c.(iii) of the Bylaw, and the tower is located at least 220 feet from the property line of any public way.
- The equipment to be mounted on the tower for the provision of wireless communications services will not extend more than 25 feet above the height of the existing transmission tower.

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<sup>8</sup> To the best of AT&T Wireless' knowledge, no other carrier submitted a bid on this RFP either.

- The top of the antennas would be at 120 ± feet; the existing BECO structure has a height of 97 ± feet from grade to the top of the tower.
- The proposed installation would be mounted on and attached to the existing BECO transmission tower: it would rest on the foundation of the tower and, by means of cross braces, it would be attached to and supported by the tower for all purposes.

71. Indeed, I understand that the Wayland Town Meeting had unanimously adopted the relevant Zoning Exemption by Article 31 of the 1997 Wayland Annual Town Meeting, the stated purpose of which was to “Encourage Use of Boston Edison Company Transmission Towers for Wireless Communications Facilities” (as the title of the Article states).

Initially, AT&T Wireless received various approvals for the proposed facility, including, without limitation:

- A Notice of Action dated February 10, 1999, signed by George Ives, Chairman on February 11, 1999, in which the Town of Wayland Planning Board granted Site Plan Approval with Conditions for AT&T Wireless’ and Omnipoint’s proposed facilities collocated on and next to BECO Tower No. 112 at the Site.
- An approval letter from the Town of Wayland Planning Board dated June 1, 1999, filed with the Town Clerk on June 4, 1999, in which the Planning Board granted an Amendment to the Site Plan Approval due to a Scrivener’s error.
- An Order of Conditions from the Town of Wayland Conservation Commission dated April 7, 1999, for AT&T Wireless’ and Omnipoint’s proposed collocated facilities.
- A Superseding Order of Conditions from the Department of Environmental Protection dated June 30, 1999, for AT&T Wireless’ and Omnipoint’s proposed collocated facilities.

However, at nearly every turn, Wayland citizens and/or the Town of Wayland attempted to stop the construction of the proposed facility by:

- Appealing the Planning Board's grant of Site Plan Approval to Middlesex Superior Court. This appeal was rejected by the Middlesex Superior Court<sup>9</sup> and the Appeals Court.<sup>10</sup>
- Appealing the Planning Board's endorsement of an Approval Not Required Plan that provided certain "freeze protection" for the proposed use. This appeal was rejected by the Middlesex Superior Court,<sup>11</sup> the Appeals Court,<sup>12</sup> and the Supreme Judicial Court.<sup>13</sup>
- Appealing the Order of Conditions from the Wayland Conservation Commission to the Department of Environmental Protection (DEP File No. 322-428). This appeal was rejected by DEP.
- Initiating and passing a one-year Moratorium on Wireless Communication Facilities at the Wayland Town Meeting on June 4, 1998 as Article 2.<sup>14</sup>

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<sup>9</sup> Patton v. Planning Bd. of Wayland, No. MICV99-01312 (Sup. Ct. filed Oct. 4, 2001) (Dismissing neighbors' appeal of Planning Board Site Plan Approval), *appeal dismissed for lack of prosecution*, No. 01-P-1858 (Mass. App. Ct. filed Apr. 8, 2002).

<sup>10</sup> Id.

<sup>11</sup> Patton v. Planning Bd. of Wayland, No. MICV98-3576 (Sup. Ct. filed Oct. 3, 2001) (Dismissing neighbors' appeal of Planning Board's endorsement of ANR Plan), *aff'd* 56 Mass. App. Ct. 1107, 778 N.E.2d 31 (2002), *further app. rev. denied*, 438 Mass. 1106, 782 N.E.2d 516 (2003).

<sup>12</sup> Id.

<sup>13</sup> Id.

<sup>14</sup> This Moratorium was adopted even though Wayland already had a strict Wireless Bylaw on the books. At a special town meeting on May 2, 1996, the Town of Wayland adopted a restrictive Wireless Communication Bylaw and Wireless Communications Services Overlay District. For example, the Bylaw established a 55 foot tower height requirement and a two mile tower separation requirement. The Overlay District was restricted to certain Town-owned property and did not contain any exemption with respect to collocating on electric utility transmission lines. At its 1997 Annual Town Meeting, the Town of Wayland amended its wireless communications zoning bylaw in a number of respects and added a specific exemption, discussed above, with respect to the "existing electric power transmission towers that are located within the Massachusetts Bay Transit Authority right-of-way which right-of-way is shown on the 'Atlas of the Town of Wayland, Massachusetts, 1994' on plates 22 through 27 inclusive ...." See Article 31 of Town of Wayland Warrant for 1997 Annual Town Meeting. The exemption applies if the following three requirements are met:

- (i) any equipment mounted on said towers for the provision of wireless communications services shall be limited in height to twenty-five (25) feet above the height of the existing transmission towers; and
- (ii) the applicant has obtained site plan approval under Section X A herein; and
- (iii) no such equipment shall be mounted on any of said towers unless said tower is located within 80 of the boundary of a Limited Commercial District or a Light Manufacturing District and said tower is located at least 220 feet from the property line of any public way.

- Initiating and passing a revised Wireless Bylaw which further restricted the available places to site a wireless communication facility in Wayland (See discussion further below).
- Opposing AT&T Wireless' and Omnipoint's request that the Massachusetts Historical Commission make a finding of "no adverse effect" of the proposed facility on historical or archaeological resources.
- Initiating and passing a revised delineation of the Historic District in Wayland Center to include the area of the proposed facility.

72. Ultimately these tactics bore fruit for the opponents of the facility. The Massachusetts Historical Commission issued an "adverse effect" finding for the proposed project on BECO Tower No. 112 on March 9, 2001 (copy attached), requiring AT&T Wireless to investigate "alternative project locations, designs, engineering and access routes" to mitigate any adverse effects on the historical and archaeological resources identified by MHC.

73. The investigation of alternative sites as required by MHC at the behest of project opponents has led directly to the present application for two viable alternative sites that would completely eliminate any adverse effects of AT&T Wireless' proposed facility on the Wayland Center Historic District or the historical and archaeological resources in the former railroad right-of-way. Indeed, from a coverage perspective, a facility either the Site or the Classic Clocks Site would address AT&T Wireless' significant coverage gap along Route 20 in a manner preferable to the previously proposed facility on BECO Tower No. 112 (which is located further west than is needed to address this gap, and which does not cover a topographical anomaly in the vicinity of the current proposed facilities).

74. In addition to AT&T Wireless' own experience in Wayland, our dealings with the Town also reflect our knowledge of how the Town has treated other carriers and the Town's arguments regarding other wireless facilities in Town.

75. I am familiar with the Decision of the United States District Court in the matter Nextel Communications of the Mid-Atlantic, Inc. v. Town of Wayland, 231 F.Supp. 2d 396, 406-407 (D. Mass. 2002) (commenting on the Town's "hostile" attitude toward wireless communications facilities and concluding "[u]nder the Telecommunications Act, the Board cannot deny the variance if in doing so it would have the effect of prohibiting wireless services"), copy attached as Exhibit T. That case concerned facilities proposed by Nextel and another carrier to be collocated on BECO Tower No. 111, the electric transmission tower immediately next to BECO Tower No. 112 on which AT&T Wireless had proposed to site its facility. As a result, I have generally familiarized myself with the Affidavit of the Town's RF consultant in that case, David P. Maxson of Broadcast Signal Lab (copy attached as Exhibit U). Mr. Maxson's testimony in that case actually helps prove my points in this case.

76. Mr. Maxson attached drive test data to his affidavit. The drive test reportedly included two heights (115' and 55') from the "Old Landfill" south of Route 20, near the Sudbury/Wayland line. In his analysis Mr. Maxson notes that both the Nextel site and the Old Landfill have the same issue with regard to the "trough" near Temple Shir Tikvah. Neither site has a direct line of sight into the trough; and both experience the same problems along Route 20 in that location. Mr. Maxson argues that therefore the Nextel site and the Old Landfill site are comparable (also based on other line of sight similarities).

77. Ironically, Mr. Maxson's testimony in that case might be offered by him to rebut the need for a facility on BECO Tower No. 112 (immediately next to the BECO Tower on which Nextel

proposed to site its facility), but it proves exactly the opposite with respect to the proposed facility at either the Site or the Classic Clocks Site. Both of those sites are quite near the Temple and as such are much better situated to provide adequate coverage both to the trough identified by Mr. Maxson and to the coverage gap as a whole.

78. In addition, Mr. Maxson's analysis criticized the "incomplete picture" of Nextel's analysis, particularly with regard to Nextel's proposed linking site in Weston. Nextel argued that the Old Landfill was too far to the west to provide the required overlap with a site in Weston. However, at the time, Nextel reportedly provided no hard location or site specifics for a facility in Weston. Mr. Maxson therefore contended that Nextel's actual or even predicted coverage from Weston was not particularly reliable. AT&T Wireless is in precisely the opposite posture: it knows the exact location and height of the Weston Police Site.

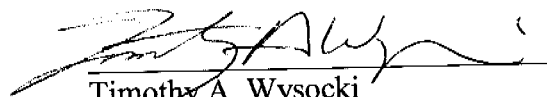
79. Mr. Maxson's data for a 115' facility at the Old Landfill, based on an 800 Mhz signal, is also inapposite to AT&T Wireless' proposed facility. AT&T Wireless' coverage plots for the Site and the Classic Clocks Site are based on its FCC-licensed PCS band, which is a higher frequency and lower power than Nextel. These coverage charts demonstrate that at 120' and -95 dBm, coverage from either the Classic Clocks or Eastern Towers site ends approximately at the Wayland-Weston town line. Coverage from a facility at the Old Landfill would drop off much sooner.

### **CONCLUSION**

80. Therefore, based on the above information, AT&T Wireless has examined the area for an appropriate means of providing the required coverage. AT&T Wireless cannot address this significant coverage gap by any site in the Wayland Wireless Communications Services District.

As shown on the included coverage maps, I have determined that the proposed facility needs to be located at either the Classic Clocks Site or the Eastern Towers Site due to technical, topographical and other unique circumstances relating to the coverage gap, and what I understand to be site acquisition problems with other sites outside the Wireless District. The installation at one of these Sites represents an appropriate means of addressing this significant gap in AT&T Wireless' coverage. Given the high traffic/demand along these roads, the topography of the area, and the limitations on PCS Wireless technology, AT&T Wireless needs the installation to serve this area of Town of Wayland. Furthermore, I believe the installation of a facility collocated with the Sprint facility within the proposed flagpole-style monopole is the least intrusive means for closing this significant gap in AT&T Wireless' coverage in this area.

Signed under the pains and penalties of perjury, this 2<sup>nd</sup> day of February, 2005.



Timothy A. Wysocki  
RF Performance Manager  
Cingular Wireless (formerly AT&T Wireless)



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Bolton, MA

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# Timothy A. Wysocki

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X

- April 26, 2004-Present      AT&T Wireless      Nashua, NH
- Experience: System Performance Manager**
- Manage Team of 11 Engineers
  - Responsible for daily performance of 850 & 1900 MHz GSM, GPRS, EDGE & TDMA networks
  - Prepared network for 2004 Democratic National Convention
- January 19, 2004 – April 26, 2004      AT&T Wireless      Nashua, NH
- Regional Planning Manager**
- Responsible for coordinating design activities and providing quality control for Boston, Philadelphia, and Washington DC markets. Insures that plan-of-record and capacity planning teams remain informed of network infrastructure expansion and quality efforts. Insures that information used by senior national and regional leadership is accurate and timely. Provides technical and project management assistance as required.
- September 2002 – January 2004      AT&T Wireless      Nashua, NH
- Lead RF Engineer**
- Designated as interim Best-In-Class Design Lead for Northeast Region. Responsible for coordinating design activities between local markets in Washington D.C., Boston, and Philadelphia and the National design team based in Redmond Washington.
  - Responsible for oversight and approval of General Dynamics and Bechtel Telecommunications RF activities for 900 Sites in AWG Boston & Upstate New York Markets. Daily activities include: providing technical support to Director of System Implementation, System Development Managers, and Vendors, monitoring budget and project schedule, and serving as technical liaison to AWG Engineering, Customer Facing Teams, and National Project Management.
  - Technical Liaison for Northeast Region co-development agreement with Cingular Wireless (Road Runner Project). Provide design approvals and serve as AWG Point of Contact.
  - Engineering representative for initial trial of co-development agreement with Sprint PCS.



July 11, 2003

**Submitted with Application**

Board of Appeals  
Town of Wayland  
Town Building  
41 Cochituate Road  
Wayland, MA 01778

**RE: Radio Frequency Coverage Report for AT&T Wireless PCS, LLC by and through its Member AT&T Wireless Services, Inc. for a Proposed Wireless Communication Facility on Either 135 Boston Post Road or 137 Boston Post Road, Wayland, Massachusetts**

Dear Members of the Board of Appeals:

This report discusses AT&T Wireless' pressing need for a wireless communications facility along Boston Post Road (Route 20) in Wayland to link up with (a) AT&T Wireless' existing 150' facility on property of the Town of Sudbury on Boston Post Road in Sudbury, (b) its proposed 90' facility on property of the Town of Weston off Boston Post Road in Weston (for which AT&T Wireless has recently been awarded the contract pursuant to the Town of Weston's Request for Proposals), and (c) AT&T Wireless' wireless communications network.

AT&T Wireless has identified two abutting properties at 135 Boston Post Road and 137 Boston Post Road, Wayland, Massachusetts, either of which is suitable for the installation of 120' multi-carrier flagpole-style wireless communication facilities, and either of which could address in a reasonable way AT&T Wireless' substantial coverage gap in this area of Wayland. AT&T Wireless is submitting zoning applications for both sites in the hope that the Board will select the most appropriate alternative to allow AT&T Wireless to finally install and operate an important facility in Wayland as part of its FCC-licensed network of wireless communication facilities.

This report addresses the need for the facility in this area of Wayland, the coverage that would be provided by either alternative at 135 Boston Post Road or 137 Boston Post Road, and why there is no other suitable alternative site reasonably available in a timely manner to address AT&T Wireless' significant coverage gap in this area of the Town of Wayland.

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## **1. QUALIFICATIONS**

I am a Senior Radio Frequency Engineer for AT&T Wireless. I have extensive experience in the design and testing of AT&T Wireless' wireless communication facilities as part of its federally licensed network in Massachusetts. For example, I currently have overall responsibility for the RF design of AT&T Wireless' Liberty Project in New England, which involves a network of hundreds of wireless communication facilities in Massachusetts, including Wayland and the surrounding communities. I have participated in the design of AT&T Wireless' network in Massachusetts from its inception to the present, and I have participated in various engineering efforts to provide a quality system build-out including: (a) evaluating zoning provisions applicable to wireless communication facilities in various communities, (b) testifying before local zoning boards in zoning hearings, (c) preparing search areas for new installations, (d) participating in drive tests and reviewing drive test results, (e) participating in site visits, (f) preparing RF designs for proposed installations, (g) reviewing plans and preparing RF packages for zoning hearings, (h) testing and evaluating new sites, and (i) locating and correcting system performance problem areas.

I have personally been involved in AT&T Wireless' efforts to site a suitable wireless communication facility or facilities in Wayland since at least 1998. I have personal knowledge of how those efforts have been stymied to the present time, despite the expenditure by AT&T Wireless of hundreds of thousands of dollars in an effort to investigate, identify, lease, design, permit, and construct a suitable facility or facilities in the Town of Wayland. I also have personal knowledge of the design of the proposed wireless communication facilities at 135 Boston Post Road and 137 Boston Post Road, and how the evolution of AT&T Wireless' network in the immediately surrounding communities dictates our specific needs in Wayland at this time. I have personally visited the area, reviewed coverage data for the proposed installation, and reviewed RF coverage information for AT&T Wireless' existing and proposed sites and potential alternative locations.

## **2. AT&T WIRELESS' NETWORK**

AT&T Wireless is licensed by the Federal Communications Commission to provide wireless phone service in areas across the country, including the Boston Metropolitan Trading Area ("MTA"). The Town of Wayland is located within the Boston MTA and therefore AT&T Wireless is licensed to provide wireless phone service within the Town of Wayland and surrounding communities.

Wireless phone coverage is provided by placement of a number of low-power antenna sites within a given area. The sites are spaced so that the coverage from each location overlaps with its neighboring sites. When a call is placed on a certain site, the phone monitors the signal from the serving site, as well as the signal of all of the adjacent sites. When the phone receives a stronger signal from an adjacent site, it requests a transfer from the site it is currently using to the

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stronger site. If there is seamless coverage provided by the carrier, the call will transfer without interruption. If there is a lack of appropriate signal strength at the transfer point, the call will degrade and possibly drop. In an area where AT&T Wireless lacks coverage altogether, an AT&T Wireless customer cannot initiate a call on AT&T Wireless' network, continue a call on AT&T Wireless' network, and/or take advantage of any other advanced features of AT&T Wireless' network for data services, short text messaging, or the like.

AT&T Wireless currently has no facilities whatsoever in Wayland. Any AT&T Wireless coverage provided in Wayland derives from its existing facilities in abutting towns.<sup>1</sup> I have attached to this report a list of the facilities currently operated or proposed by AT&T Wireless in Concord, Framingham, Lexington, Lincoln, Maynard, Natick, Newton, Sherborn, Sudbury, Waltham, Wellesley and Weston. I have also attached a coverage map showing AT&T Wireless' actual and anticipated coverage from the actual or proposed facilities at these locations.

As can be seen from the list of facilities and the coverage map, AT&T Wireless has no sites operating in Wayland, and AT&T Wireless has a significant gap in coverage in Wayland. Also as can be seen, as more and more facilities in abutting towns are fixed as to location and height, the opportunity to fill any remaining substantial coverage gaps narrows down to specific geographic areas and heights. Such is the case in Wayland.

Thus, AT&T Wireless has aggressively pursued the build-out of its network in Wayland (although thus far unsuccessfully) and the communities surrounding Wayland, among other places, because they represent major population centers with a high volume of actual and potential customers of AT&T Wireless' services, and they are traversed by a number of federal and state highways along which there is a pressing demand for wireless communication services. Without limitation, AT&T Wireless has aggressively pursued the build-out of its network along Route 20 because it is a major state-numbered road carrying a significant volume of traffic to and from Interstate 95/Route 128 and the Massachusetts Turnpike.

It is customary in the field of Radio Frequency design of wireless communication networks for experts such as myself to review and rely upon published traffic volume data from the Massachusetts Highway Department ("MHD"). MHD has published the following Average Daily Traffic Counts for state-numbered roads in Wayland in 1999:

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<sup>1</sup> AT&T Wireless does have a roaming agreement with another FCC-licensed wireless carrier in this area; however, that carrier too lacks adequate coverage in Wayland so even roaming service is unavailable. Indeed, to the best of AT&T Wireless' knowledge, none of the six major FCC-licensed carriers doing business in this area has any facilities in Wayland.

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| LOCATION                   | AVERAGE DAILY TRAFFIC |
|----------------------------|-----------------------|
| Route 20 East of Route 27  | 23,100                |
| Route 20 West of Route 27  | 18,600                |
| Route 27 North of Route 20 | 25,000                |
| Route 27 South of Route 20 | 16,400                |

This is a significant volume of traffic and reflects the actual pressing need for high quality wireless communication services along Route 20 and in surrounding areas.

To address this pressing need for wireless communications facilities along Boston Post Road (Route 20), AT&T Wireless has constructed a 150' multi-carrier facility on property of the Town of Sudbury on Boston Post Road in Sudbury (which it was awarded pursuant to a Request for Proposals issued by the Town of Sudbury), and AT&T Wireless has recently been awarded the contract pursuant to the Town of Weston's Request for Proposals to install a proposed 90' flagpole-style facility on property of the Town of Weston off Boston Post Road in Weston. Both the Town of Sudbury and the Town of Weston have very restrictive Wireless Bylaws, and the choice of locations in these towns is fixed. The Sudbury Landfill facility is on property which essentially abuts to Town of Wayland. The Town of Weston facility is proposed for the Weston Police Station parcel located approximately 1.25 miles from the Weston-Wayland town line. There is therefore no reasonable way to install another wireless communication facility in either Sudbury or in Weston to address AT&T Wireless' substantial coverage gap in Wayland along Route 20 between these two sites. Only a site in Wayland can accomplish this.

### 3. THE PROPOSED FACILITY

At whichever alternative is selected (135 Boston Post Road or 137 Boston Post Road), AT&T Wireless proposes to collocate its wireless communications facility with Sprint within and next to a stealth flagpole-style monopole, at the Site.

As shown on the plans submitted with AT&T Wireless' zoning applications, AT&T Wireless' proposed facility consists of the following:

- AT&T Wireless will install three (3) wireless communication antenna sectors within a proposed 120' self-supported stealth flagpole-style monopole. (AT&T Wireless would have the top spot (at 117' antenna centerline) on the Eastern Towers monopole and the second spot (105' antenna centerline) on the proposed Sprint monopole at the Classic Clocks site.)

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- The antennas will be connected to telecommunications equipment in Ericsson RBS 2106 equipment cabinet(s) located within the proposed compound at the base of the tower by means of coaxial cables. The coaxial cables will run from the antenna down the inside of the monopole, exit out a port at the base of the monopole and run covered within a cable tray to the Ericsson RBS 2106 equipment cabinet(s).
- The facility will be connected to standard electric and telephone utilities to be installed within the proposed equipment compound.

The proposed PCS wireless facility will enhance wireless telephone service to the residents and businesses of Wayland. Through a fully digital system, this technology affords improved reception, more private communication, increased ability to handle data, short messaging, enhanced cellular battery life, and other technological advances.

The characteristics of the proposed installation are as follows:

- Number of AT&T Wireless' antennas to be located on the tower: Three
- Antenna type, manufacturer and model number Allgon 7262.02
- For each antenna, the antenna gain and antenna radiation pattern: 16dBi and 90 degree beamwidth
- Number of channels per antenna projected are two and can go to the maximum of four.
- Maximum power output of BTS cabinet is 28 watts.
- Output frequency of the transmitter is in the A-Band 1900 MHz.

AT&T Wireless' proposed use is passive, requires no employees on the premises, and will generate only about one vehicle trip per month, will be served by standard electrical service, and requires no water, sewer or other town services. AT&T Wireless' facility will comply in all respects with RF emission standards established by the Federal Communication Commission and administered the Massachusetts Department of Public Health. AT&T Wireless' facility will generate no objectionable noise, vibration, smoke, dust, odors, heat, glare or other effects.

#### **THE NEED FOR THE PROPOSED FACILITY**

To demonstrate why the proposed use is necessary, I have attached the following coverage maps of the Town of Wayland and the surrounding area:

- One map without either proposed facility;
- A second map with the proposed facility at the Eastern Towers site and without the proposed facility at the Classic Clocks site;



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- A third map with the proposed facility at the Classic Clocks site and without the proposed facility at the Eastern Towers site;
- A fourth map with a proposed facility at the Eastern Towers site at 55' and without the proposed facility at the Classic Clocks site; and
- A fifth map with the proposed facility at the Classic Clocks site at 45' and without the proposed facility at the Eastern Towers site.

Pursuant to §§ 198-1504.2.4.1 and 198-1504.2.4.2 of the Bylaw, I have also attached a coverage map (without either proposed facility) to demonstrate AT&T Wireless' other existing and proposed facilities within five (5) miles of the Wayland border.

These coverage maps were generated using a radio frequency propagation computer-modeling program. The software takes into account the geographical features of an area, antenna models, antenna heights, and RF transmit power. The maps represent existing and proposed antenna locations, and the areas that currently have quality wireless phone service based on these locations. Any phone that travels outside of the effective coverage area will have a high likelihood of a degraded and possibly dropped call.

These maps show that there is currently a substantial coverage gap throughout much of Wayland including, without limitation, from the vicinity of Wayland Center (where the coverage from the Sudbury facility drops off), easterly along Route 20 (to where the proposed coverage from the Weston facility would pick up), and the areas adjacent to these roads. These are high-demand areas in which AT&T Wireless currently lacks adequate communications service.

#### **THE ABSENCE OF SUITABLE ALTERNATIVES**

##### **Existing and Proposed AT&T Wireless Sites Wayland and Within Five (5) Miles of the Town of Wayland**

In addition to the attached coverage maps, I have also attached a chart listing certain site information for each of AT&T Wireless' other existing and proposed facilities within five (5) miles of the Wayland border. As demonstrated by the attached coverage maps, these other existing or proposed sites do not already provide adequate coverage, and do not have the potential, by site adjustment, to provide adequate coverage, to the area of Wayland that would be addressed by the proposed facility. Because of factors such as the location of these sites with respect to the Wayland coverage gap in question, the available height at these sites, the intervening topography, and the limitations of PCS wireless technology, I am unable to describe any reasonable potential changes to these existing facilities or sites that would enable them to be used by AT&T Wireless to provide adequate coverage to this significant gap in coverage in this area of Wayland.

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**AT&T Wireless' Proposed Facility on BECO Tower 112**

Beginning in approximately 1998, AT&T Wireless has worked to site a facility on a power mount pole mounted on an existing Boston Edison electric transmission tower on a discontinued MBTA railroad right-of-way in Wayland center. At the time AT&T Wireless proposed this facility (to be collocated with a proposed facility of Omnipoint Communications, now T-Mobile), AT&T Wireless relied on Section X F 6 of the Wayland Wireless Communications Services District Bylaw which exempted the proposed wireless communication facilities from the Wireless Communications provisions of the Zoning Bylaw because:

- The existing electric power transmission tower number 112 is situated in the MBTA right-of-way described in X F 6 c. of the Bylaw.
- The tower is located within 80 feet of the boundary of a Limited Commercial District or Light Manufacturing District under Section X F 6 c.(iii) of the Bylaw, and the tower is located at least 220 feet from the property line of any public way.
- The equipment to be mounted on the tower for the provision of wireless communications services will not extend more than 25 feet above the height of the existing transmission tower.
- The top of the antennas would be at 120 ± feet; the existing BECO structure has a height of 97 ± feet from grade to the top of the tower.
- The proposed installation would be mounted on and attached to the existing BECO transmission tower: it would rest on the foundation of the tower and, by means of cross braces, it would be attached to and supported by the tower for all purposes.

Indeed, I understand that the Wayland Town Meeting had unanimously adopted the relevant Zoning Exemption by Article 31 of the 1997 Wayland Annual Town Meeting, the stated purpose of which was to "Encourage Use of Boston Edison Company Transmission Towers for Wireless Communications Facilities" (as the title of the Article states).

Initially, AT&T Wireless received various approvals for the proposed facility, including, without limitation:

- A Notice of Action dated February 10, 1999, signed by George Ives, Chairman on February 11, 1999, in which the Town of Wayland Planning Board granted Site Plan Approval with Conditions for AT&T Wireless' and Omnipoint's proposed facilities collocated on and next to BECO Tower No. 112 at the Site.



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- An approval letter from the Town of Wayland Planning Board dated June 1, 1999, filed with the Town Clerk on June 4, 1999, in which the Planning Board granted an Amendment to the Site Plan Approval due to a Scrivener's error.
- An Order of Conditions from the Town of Wayland Conservation Commission dated April 7, 1999 for AT&T Wireless' and Omnipoint's proposed collocated facilities.
- A Superseding Order of Conditions from the Department of Environmental Protection dated June 30, 1999 for AT&T Wireless' and Omnipoint's proposed collocated facilities.

However, at nearly every turn, Wayland citizens and/or the Town of Wayland attempted to stop the construction of the proposed facility by:

- Appealing the Planning Board's grant of Site Plan Approval to Middlesex Superior Court. This appeal was rejected by the Middlesex Superior Court<sup>2</sup> and the Appeals Court.<sup>3</sup>
- Appealing the Planning Board's endorsement of an Approval Not Required Plan that provided certain "freeze protection" for the proposed use. This appeal was rejected by the Middlesex Superior Court,<sup>4</sup> the Appeals Court,<sup>5</sup> and the Supreme Judicial Court.<sup>6</sup>
- Appealing the Order of Conditions from the Wayland Conservation Commission to the Department of Environmental Protection (DEP File No. 322-428). This appeal was rejected by DEP.

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<sup>2</sup> Patton v. Planning Bd. of Wayland, No. MICV99-01312 (Sup. Ct. filed Oct. 4, 2001) (Dismissing neighbors' appeal of Planning Board Site Plan Approval), *appeal dismissed for lack of prosecution*, No. 01-P-1858 (Mass. App. Ct. filed Apr. 8, 2002).

<sup>3</sup> *Id.*

<sup>4</sup> Patton v. Planning Bd. of Wayland, No. MICV98-3576 (Sup. Ct. filed Oct. 3, 2001) (Dismissing neighbors' appeal of Planning Board's endorsement of ANR Plan), *aff'd* 56 Mass. App. Ct. 1107, 778 N.E.2d 31 (2002), *further app. rev. denied*, 438 Mass. 1106, 782 N.E.2d 516 (2003).

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

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- Initiating and passing a one-year Moratorium on Wireless Communication Facilities at the Wayland Town Meeting on June 4, 1998 as Article 2.<sup>7</sup>
- Initiating and passing a revised Wireless Bylaw which further restricted the available places to site a wireless communication facility in Wayland (See discussion further below).
- Opposing AT&T Wireless' and Omnipoint's request that the Massachusetts Historical Commission make a finding of "no adverse effect" of the proposed facility on historical or archaeological resources.
- Initiating and passing a revised delineation of the Historic District in Wayland Center to include the area of the proposed facility.

Ultimately these dilatory tactics bore fruit for the opponents of the facility. The Massachusetts Historical Commission issued an "adverse effect" finding for the proposed project on BECO Tower No. 112 on March 9, 2001 (copy attached), requiring AT&T Wireless to investigate "alternative project locations, designs, engineering and access routes" to mitigate any adverse effects on the historical and archaeological resources identified by MHC.

The required investigation of alternative sites has led directly to the present application for two viable alternative sites that would completely eliminate any adverse effects of AT&T Wireless' proposed facility on the Wayland Center Historic District or the historical and archaeological resources in the former railroad right-of-way. Indeed, from a coverage

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<sup>7</sup> This Moratorium was adopted even though Wayland already had a strict Wireless Bylaw on the books. At a special town meeting on May 2, 1996, the Town of Wayland adopted a restrictive Wireless Communication Bylaw and Wireless Communications Services Overlay District. For example, the Bylaw established a 55 foot tower height requirement and a two mile tower separation requirement. The Overlay District was restricted to certain Town-owned property and did not contain any exemption with respect to collocating on electric utility transmission lines. At its 1997 Annual Town Meeting, the Town of Wayland amended its wireless communications zoning bylaw in a number of respects and added a specific exemption, discussed above, with respect to the "existing electric power transmission towers that are located within the Massachusetts Bay Transit Authority right-of-way which right-of-way is shown on the 'Atlas of the Town of Wayland, Massachusetts, 1994' on plates 22 through 27 inclusive ...." See Article 31 of Town of Wayland Warrant for 1997 Annual Town Meeting. The exemption applies if the following three requirements are met:

- (i) any equipment mounted on said towers for the provision of wireless communications services shall be limited in height to twenty-five (25) feet above the height of the existing transmission towers; and
- (ii) the applicant has obtained site plan approval under Section X A herein; and
- (iii) no such equipment shall be mounted on any of said towers unless said tower is located within 80 of the boundary of a Limited Commercial District or a Light Manufacturing District and said tower is located at least 220 feet from the property line of any public way.

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perspective, either the Classic Clocks facility or the Eastern Towers facility would address AT&T Wireless' significant coverage gap along Route 20 in a manner preferable to the previously proposed facility on BECO Tower No. 112 (which is located further west than is needed to address this gap, and which does not cover a topographical anomaly in the vicinity of the current proposed facilities). See below.

### The Town of Wayland Wireless Communications Services District

After AT&T Wireless and Sprint approached the Town of Wayland to initiate a building permit application for the proposed facilities, the Town's Executive Secretary Jeff Ritter sent a certified letter stressing the Town's desire to have the carriers locate a facility within the Town's existing Wireless Overlay District, and in particular BECO stanchions 101 and 102 and the Old Landfill. The letter indicated the Town's belief that those locations would be able to connect to the Weston Police station site.

In my professional opinion, it is not possible to address AT&T Wireless' substantial coverage gap along Boston Post Road (Route 20) in Wayland between AT&T Wireless' existing 150' facility on property of the Town of Sudbury on Boston Post Road in Sudbury, and its proposed 90' facility on property of the Town of Weston off Boston Post Road in Weston (for which AT&T Wireless has recently been awarded the contract pursuant to the Weston's Request for Proposal), by using a conforming facility in the Town's existing Wireless Overlay District, and in particular BECO stanchions 101 and 102 and/or the Old Landfill. Further, the Town's existing Wireless Overlay District, and BECO stanchions 101 and 102 and the Old Landfill, are in close proximity to AT&T Wireless' Sudbury Facility, raising very real concerns about interference between the sites, overlapping coverage, and inefficient use of AT&T Wireless' allotted spectrum. These concerns are so serious that AT&T Wireless evaluated but declined to even bid on the Town of Wayland's Request for Proposals, with bids due by 12:00 noon, Friday, September 20, 2002, for a wireless communication facility on Town-owned property in the Wireless Overlay District.<sup>8</sup>

Thus, Wayland's current wireless communications facilities zoning bylaw establishes the following Wireless Communications Services District where such facilities are permitted by special permit with site plan review:

§198-302.1.8 A Wireless Communications Services District that includes the land owned by the Town of Wayland known as the "old landfill site" as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22 and 23, Parcels 22-001 and 22-002, and known as the "new landfill site" as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 17, 21, and 22 inclusive, Parcels 17-018, 21-010A, 21-012A, 21-012B, 21-012C, 21-012D, 21-012E, 21-

<sup>8</sup>

To the best of AT&T Wireless' knowledge, no other carrier submitted a bid on this RFP either.

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012F, 21-012G, 22-003, 22-004, 22-006, 22-007; and the land comprising the portion of the so-called Massachusetts Bay Transit Authority, currently known as Massachusetts Bay Transportation Authority (MBTA), "right-of-way from its boundary with the southerly sideline of Boston Post Road (Route 20) westerly to its westernmost boundary with the Town of Sudbury as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22, 26 and 27, inclusive, and as shown on the plan entitled "Town of Wayland Wireless Communications Services District Special Town Meeting - November 17, 1999," dated September 16, 1999, prepared by the Town of Wayland Survey Department, a copy of which plan is on file in the Office of the Town Clerk (Added STM 11/17/99 by Art. 3); and

§198-1502.1. The Wireless Communications Services District shall be located on land owned by the Town of Wayland known as the "old landfill site" (as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22 and 23, Parcels 22-001 and 22-002), and part of the land known as the "new landfill site" (as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 17, 21 and 22, inclusive, that part of Parcel 17-018 that is south of a continuation of the parcel line that extends northeasterly from the point of the intersection of parcel lines for Parcels 21-010A, 21-012F, 22-004 and 17-018 to meet the northeast parcel line of Parcel 17-018, Parcels 21-010A, 22-003, 22-004, 22-006 and 22-007) and on the land comprising the portion of the so-called Massachusetts Bay Transit Authority, currently known as "Massachusetts Bay Transportation Authority (MBTA), "right-of-way from its boundary with the southerly sideline of Boston Post Road (Route 20), westerly to its westernmost boundary with the Town of Sudbury as shown in the Atlas of the Town of Wayland, Massachusetts, 1996, on Plates 22, 26 and inclusive, and as shown on the plan entitled "Town of Wayland Wireless Communications Services District Special Town Meeting - November 17, 1999," dated September 16, 1999, prepared by the Town of Wayland Survey Department, a copy of which plan is on file in the Office of the Town Clerk. (Amended 11-17-1999 STM by Art. 3; 5-4-2000 ATM by Art. 33).

The Bylaw provides that a wireless communication facility "may be erected in the Wireless Communications Services District upon the issuance of a special permit ... and subject to site plan approval...." and subject to the various requirements of the Bylaw. See § 198-1503.1. The Bylaw establishes the following height limit for new towers:

1503.2 4.1. Except for the BECO towers [in the District], if there is no significant tree canopy elevation, as defined in § 198-1503.2.4.2 below, the maximum height of any antenna support structure or any antenna or any component thereof or attachment thereto **shall not exceed 55 feet above finished grade of ground elevation.** (emphasis added).

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1503.2.4.2. For the purpose of this Article 15, "significant tree canopy elevation" shall be defined as the arithmetic average of the elevations of the tops of all trees at least 6 inches in diameter at four feet and over 20 feet tall in a stand of trees, all of which are located within a 150-foot radius of the base of the proposed antenna support structure, provided that at least 10 such trees are in said stand. Elevations shall be measured with respect to mean sea level datum.

1503.2.5. Except for the BECO towers, **no antenna**, nor any support structure, nor any antenna or any component thereof or attachment thereto **shall be located at a height in excess of 55 feet**, unless there is such a significant tree canopy elevation, as defined in Section 198-1503.2.4.2 above.

The Bylaw provides the following additional height limitation with respect to facilities located on BECO towers in the District:

1503.2.14. Any antenna or equipment mounted on or attached to any of the BECO towers **shall not extend more than 25 feet above the highest point of said towers.** (emphasis added)

Thus, the District essentially consists of the Wayland Landfill (new and old) and the portion of the MBTA right of way from Route 20 to the Wayland/Sudbury town line. The Wayland Landfill is proximate to the Sudbury Landfill where AT&T Wireless has installed a 150' flagpole style monopole capable of accommodating itself and two other carriers. The attached coverage charts show the coverage footprint from AT&T Wireless' facility at the Sudbury Landfill. Coverage from that facility extends for some distance into Wayland. If AT&T Wireless were to construct a new 55' tower at the Wayland Landfill (the maximum height allowed by the Wayland Bylaw in the absence of a significant tree canopy), the coverage from that facility would be inferior to and redundant of AT&T Wireless' installation at the Sudbury Landfill. Even a significantly taller new tower at the Wayland Landfill would be inferior to and largely redundant of AT&T Wireless' installation at the Sudbury Landfill.

The Sudbury Landfill is situated at the top of the hill next to Route 20 at the Sudbury/Wayland town line. The MBTA corridor running from the Wayland/Sudbury town line to the southerly sideline of Route 20 is at a significantly lower elevation than the Sudbury Landfill. Collocation of a wireless communications facility to the maximum allowed height of 25' above a BECO tower in Wayland's Wireless Communications Services District would result in coverage that is inferior to and redundant of the coverage from the Sudbury Landfill facility. It would not close the coverage gap to the proposed Weston facility.

I am familiar with the Decision of the United States District Court in the matter Nextel Communications of the Mid-Atlantic, Inc. v. Town of Wayland, 231 F.Supp. 2d 396, 406-407 (D. Mass. 2002) (commenting on the Town's "hostile" attitude toward wireless communications



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facilities and concluding "[u]nder the Telecommunications Act, the Board cannot deny the variance if in doing so it would have the effect of prohibiting wireless services"). That case concerned facilities proposed by Nextel and another carrier to be collocated on BECO Tower No. 111, the electric transmission tower immediately next to BECO Tower No. 112 on which AT&T Wireless had proposed to site its facility. As a result, I have generally familiarized myself with the Affidavit of the Town's RF consultant in that case, David P. Maxson of Broadcast Signal Lab (copy attached). Mr. Maxson's testimony in that case actually helps prove my points in this case.

For example, Mr. Maxson attaches drive test data to his affidavit. The drive test reportedly included two heights (115' and 55') from the "Old Landfill" south of Route 20, near the Sudbury/Wayland line. In his analysis Mr. Maxson notes that both the Nextel site and the Old Landfill have the same issue with regard to the "trough" near Temple Shir Tikvah. Neither site has a direct line of sight into the trough; and both experience the same problems along Route 20 in that location. Mr. Maxson argues that therefore the Nextel site and the Old Landfill site are comparable (also based on other line of sight similarities).

Ironically, Mr. Maxson's testimony in that case might be offered by him to rebut the need for a facility on BECO Tower No. 112 (immediately next to the BECO Tower on which Nextel proposed to site its facility), but it proves exactly the opposite with respect to the proposed facility at either the Classic Clocks or Eastern sites. Both of those sites are quite near the Temple and as such are much better situated to provide adequate coverage both to the trough identified by Mr. Maxson and to the coverage gap as a whole..

In addition, Mr. Maxson's analysis criticized the "incomplete picture" of Nextel's analysis, particularly with regard to Nextel's proposed linking site in Weston. Nextel argued that the Old Landfill was too far to the west to provide the required overlap with a site in Weston. However, at the time, Nextel reportedly provided no hard location or site specifics for a facility in Weston. Mr. Maxson therefore contended that Nextel's actual or even predicted coverage from Weston was not particularly reliable. AT&T Wireless is in precisely the opposite posture: it knows exactly where and how high its proposed facility in Weston is, because it has won a Town-sponsored RFP to put it there. AT&T Wireless' coverage analysis for Weston is based on specific coordinates and heights.

Mr. Maxson's data for a 115' facility at the Old Landfill, based on an 800 Mhz signal, is also inapposite to AT&T Wireless' proposed facility. AT&T Wireless' coverage plots for the Classic Clocks and Eastern Towers sites are based on its FCC-licensed PCS band, which is a higher frequency and lower power than Nextel. These coverage charts demonstrate that at 120' and -95 dBm, coverage from either the Classic Clocks or Eastern Towers site ends approximately at the Wayland-Weston town line. Coverage from a facility at the Old Landfill would drop off much sooner.

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In short, AT&T Wireless cannot reasonably address its significant coverage gap for which the current facility is proposed by any conforming site in the Wayland Wireless Communications Services District.

### CONCLUSION

Therefore, based on the above information, AT&T Wireless has examined the area for an appropriate means of providing the required coverage. As shown on the included coverage maps, I have determined that the proposed facility needs to be located at either the Classic Clocks Site or the Eastern Towers Site due to technical, topographical and other unique circumstances relating to the coverage gap. The installation at one of these Sites represents an appropriate means of addressing this significant gap in AT&T Wireless' coverage. Given the high traffic/demand along these roads, the topography of the area, and the limitations on PCS Wireless technology, AT&T Wireless needs the installation to serve this area of Town of Wayland. Furthermore, the installation of a facility collocated with the Sprint facility within the proposed flagpole-style monopole is the least intrusive means for closing this significant gap in AT&T Wireless' coverage in this area.

AT&T Wireless cannot address this significant coverage gap by any site in the Wayland Wireless Communications Services District. As more fully discussed above, from an RF standpoint, there are no available alternatives to the proposed facility.

I hope that this information will assist the Town in its decision-making process. I look forward to meeting with you and discussing the information included in this report as well as providing any additional information that you may require.

Sincerely,



Tim Wysocki  
Senior RF Engineer